SISTEMI E MICROSISTEMI

RED – G

INSTRUCTION MANUAL

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1 – INTRODUCTION

RED-G is an automatic rescue device for lift systems equipped with inverter: rope lifts, both with asynchronous and synchronous motors, or hydraulic lifts.

RED-G has to be installed on the 3-phase 400Vac mains; in case of power failure, it fully supplies the lift system with the necessary power to move the car at reduced speed, in any direction and in any load condition.

RED-G is supplied by batteries and it has got a sine wave and stabilized output voltage, so it is suitable for any lift installation.
An optional board makes it easy to install even in existing lifts, which were not prearranged for the emergency operation.

RED-G is built-up in a short depth metal box, to be installed directly on the lift shaft, and it is pre-wired for the easiest and fastest connection.

This manual provides you the necessary information about wiring, put on service and the operation of RED-G, please read it carefully before going on with the installation.

2 – GENERAL DESCRIPTION

RED-G is available in two sizes:

- SIZE 1 Output Voltage: 3~400Vac Power: 2kW for 15', Allowed Overload: 3kW for 1'
  Battery Supply: 48V (N°4 Batteries series connect ed, 12V 18Ah)
- SIZE 2 Output Voltage: 3~400Vac Power: 4kW for 15', Allowed Overload: 6kW for 1'
  Battery Supply: 96V (N°8 Batteries series connect ed, 12V 18Ah)

The device is built-up in a metal box and it's made up of the following components:
battery-charger, three-phase inverter, L/C filter, elevator transformer and the contactors that switch the power supply.

The BATTERIES must be placed outside the metal box.

3 – OPERATION PRINCIPLE

RED-G detects the mains power failure (even of a single phase) and after a few seconds the rescue operation starts:

- The power supply, which normally comes from the mains, is cut.
- Next, the 3-phase inverter switches on in order to reproduce the mains supply voltage, through the elevator transformer and the L/C filter. It supplies the control panel with the necessary power to move the car at reduced speed. This speed is simply obtained using a "voltage free" contact of <rescue operation in progress> available in RED-G (if the control panel is prearranged for this operation), or adding an optional board that drives the control panel to run a controlled reset travel operation, that stops at the first floor reached.
- RED-G ends its operation and shuts down after an adjustable time after the car stops at floor, in order to allow the automatic door to open, so the people in the car can easily go out.
- When the RED-G operation comes to an end, the lift system is put again in the original operation condition, connected to the mains.

A new rescue operation would be carried out only after the mains supply comes back and then it misses again.

RED-G can be also activated with an external input to move the car both with the presence or the absence of the mains power supply.

4 – INSTALLATION

RED-G is pre-wired and can be easily wall-mounted, near the control panel or in the shaft (in case of MRL lift system).

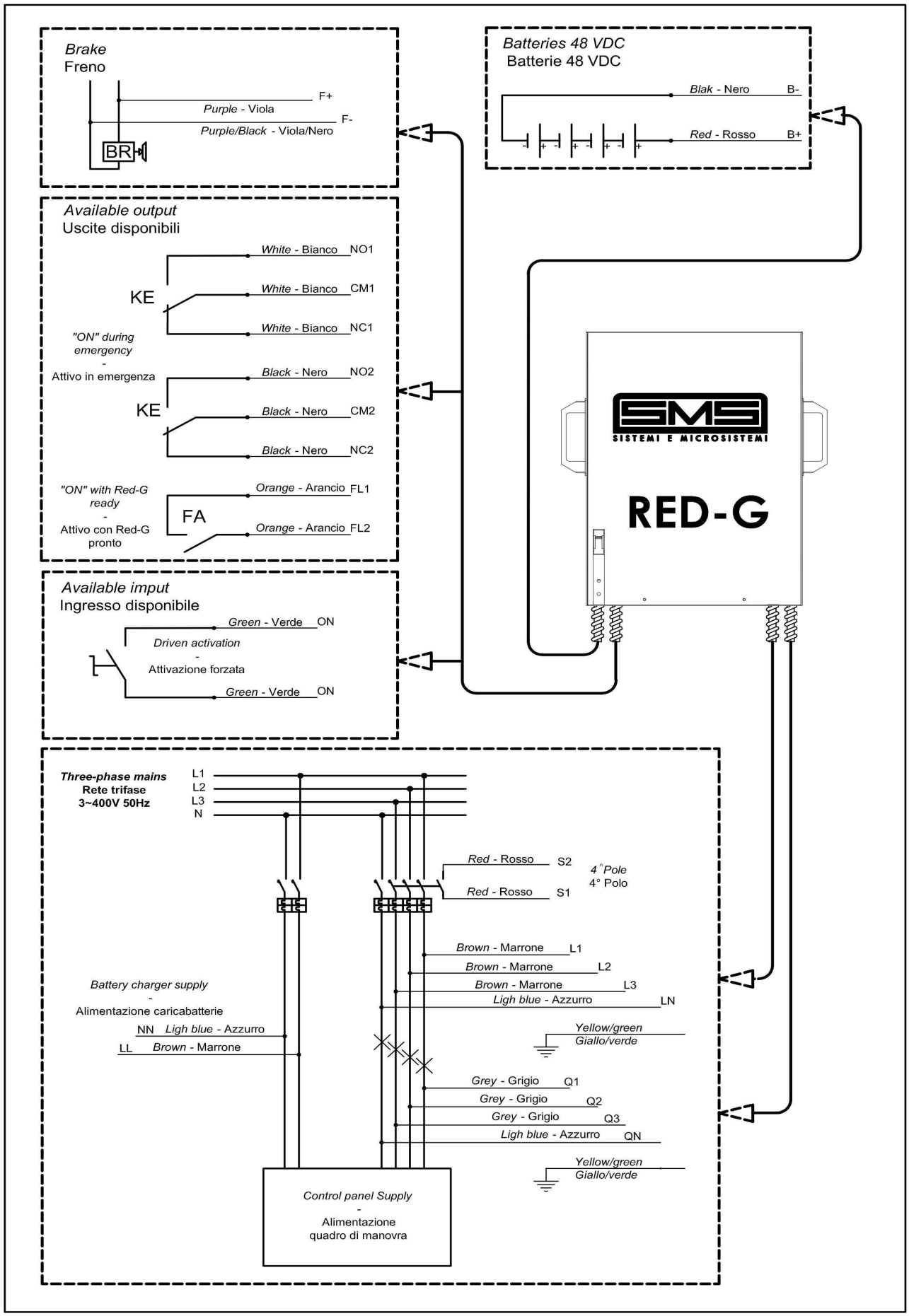
The connections must be carried out with the Mains Power Switch and Car Light Switch of the lift system, and the RED-G Main Switch IE all open, following the WIRING DIAGRAM in paragraph 5), taking into consideration the following clarifications:

- Connect the 1~230V 50Hz battery-charger supply to the terminals LL – NN (**BROWN-LIGHT BLUE** wires).
- Connect the batteries in series and the terminals B+ – B- (**RED – BLACK** wires) to the batteries, as shown in the following drawing:

- Cut off the lift system main power, connecting the 3-phase MAINS and the NEUTRAL to the terminals L1 – L2 – L3 – LN of RED-G (**BROWN** (3-phase mains) **+ LIGHT BLUE** (neutral)), and the supply voltage of the lift system (control panel) to the terminals Q1 – Q2 – Q3 – QN (**GRAY** (3 phases) **+ LIGHT BLUE** (neutral)).
  Connect the wires **YELLOW/GREEN** to the EARTH.
- Connect the terminals S1-S2 (**ROSSO** wires) to the 4th pole of the Mains General Switch.
  If the 4th pole is open, the rescue operation is disabled.
- Connect the terminals F+ – F- (**PURPLE – PURPLE/BLACK** wires) in parallel to the motor brake coil. Respect the polarities, connecting the positive terminal to F+.
- If you need, connect the terminals ON – ON (**GREEN** wires) to an external contact to control the forced activation or the TEST of the RED-G device: when this command goes on, RED-G will perform a full emergency cycle, using the voltage provided by the batteries if the Dip Switch SW1 – 5 is OFF, or using the mains voltage if the Dip Switch SW1 – 5 is ON (See Paragraph 6).
- On the terminals CM1 – NO1 – NC1 (**WHITE** wires) and CM2 – NO2 – NC2 (**BLACK** wires) 2 switching contacts of the KE relay are available; the KE relay is ON during the whole emergency cycle, so these contacts can be used to give the emergency command to the control panel and to the inverter, in order to make the car move at low speed.
- On the terminals FL1 – FL2 (**ORANGE** wires) a **N.O.** contact of the FA relay is available; in the standard configuration, the FA relay works as <READY> (it is always closed, except when RED-G detects a malfunction or a failure.
  If you need, you can use the **N.C.** contact, moving the connector from CN17 to CN16 son the RGCON board.

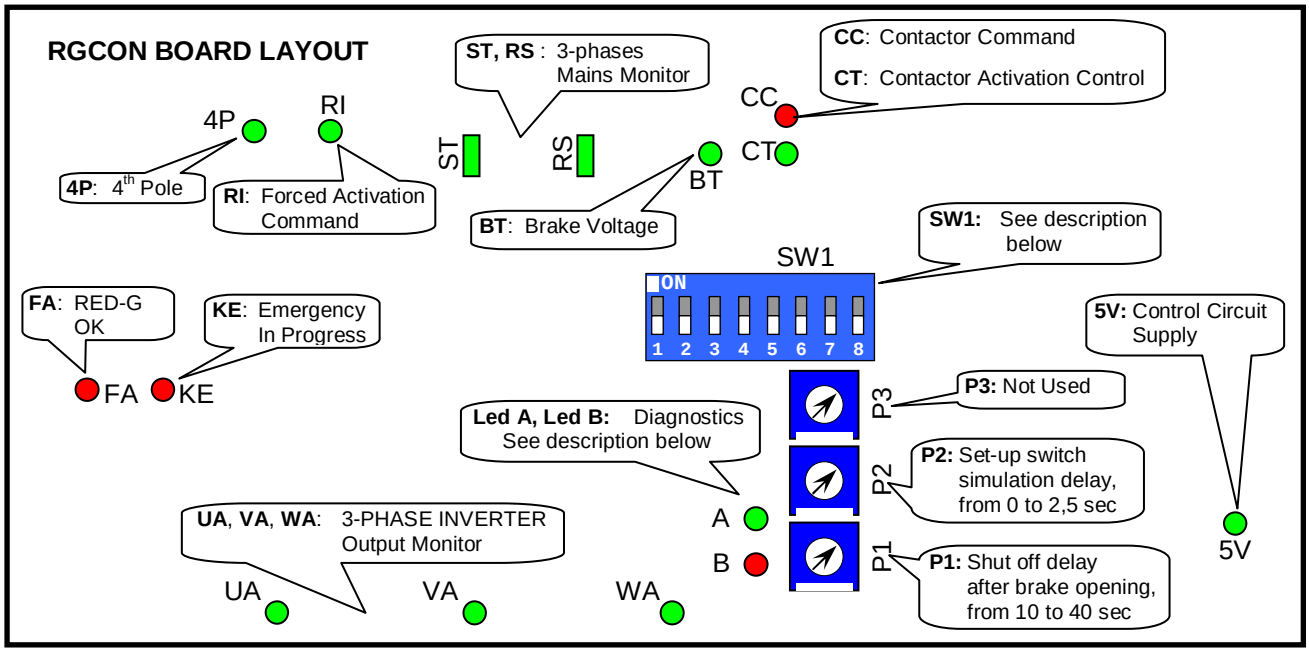
  As an alternative, the FA relay con work as <RESCUE OPERATION IN PROGRESS> (energized during the whole emergency cycle), setting the Dip Switch SW1 – 3 in ON position (See Paragraph 6).

5 – WIRING DIAGRAM



6 – SETTINGS, ADJUSTMENTS AND SIGNALS

The Dip Switch SW1 used for the RED-G SETTINGS, the ADJUSTMENT Trimmer and the SIGNAL Leds are placed in the RGCON control board.



DIP switch SW1	Description	
1 (*)	OFF: SET-UP SWITCH ACTIVATION DELAY DISABLED	ON: SET-UP SWITCH ACTIVATION DELAY ENABLED
2 (*)	OFF: SET-UP SWITCH SIMULATION ACTIVATING THE KD OUTPUT	ON: SET-UP SWITCH SIMULATION ACTIVATING THE KS OUTPUT
3	OFF: "FA" OUTPUT WORKS AS <READY> (RED-G OK)	ON: "FA" OUTPUT WORKS AS <RESCUE OPERATION IN PROGRESS>
4 (*)	OFF: STOP ZONE SWITCH (EVENTUAL) WITH N.C. CONTACT	ON: STOP ZONE SWITCH (EVENTUAL) WITH N.O. CONTACT
5	OFF: OPERATION TEST PERFORMED USING BATTERY VOLTAGE	ON: OPERATION TEST PERFORMED USING MAINS VOLTAGE
6	OFF: RESCUE OPERATION STARTS AFTER 4 SECONDS FROM THE POWER FAILURE	ON: RESCUE OPERATION STARTS AFTER 8 SECONDS FROM THE POWER FAILURE
7	NOT USED	
8	NOT USED	
NOTE (*): The switches 1 – 2 – 4 are meaningful only when the RGOPA optional board is used, to install RED-G in an existing lift system, for the proper adjustment please refer to the next paragraph 7.		

Led A	Led B	Description	Notes
○	○	RED-G not ready (4th Pole open)	○ = Led OFF ● = Led ON ✖ = Led FLASHING SLOWo ✹ = Led FLASHING FAST
●	○	RED-G ready to rescue operation	
○	●	Rescue operation in progress	
●	●	Rescue operation ended	
✖	✖	Maximum operating time expired	
✖	○	Contactors "locked on"	
○	✖	Contactors not energized	
○	✹	Wrong Battery voltage	
✹	○	Wrong Control circuit supply voltage	
●	✹	Inverter Overcurrent	
●	✖	Medium Current too high	
✹	✹	Overload	

Leds on the FRONT PANEL		
GREEN Led	ON:	RED-G Powered
RED Led	FLASHING:	Rescue Operation IN PROGRESS
	ON:	RED-G has detected a malfunction or a failure

7 – OPTIONAL CONNECTIONS FOR INSTALLATION IN EXISTING LIFT SYSTEMS (RGOPA BOARD)

When RED-G is installed in an existing lift system, it is necessary to add an optional board (RGOPA), to check the lift operation when you switch on the power supply and to set accordingly RED-G, following the instructions listed in this paragraph.

The following operations are necessary to assure that, when the lift is controller by RED-G, it runs at low speed, stops at the next floor and opens the automatic doors.

You must perform the TESTS listed below, following the instructions for a proper setting of RED-G.

Place the lift car within the bottom floor slowing-down zone, out from the stop zone

WHAT HAPPENS WHEN YOU SWITCH ON THE POWER IN THIS CONDITION?

- The car runs in down direction and stops at bottom floor.
  - **SW1 – 1 = OFF**
    SW1 – 2 = OFF
- The car runs in up direction.
  - Place the lift car between 2 intermediate floors, out from the slowing-down zone of the top and bottom floors.

    WHAT HAPPENS WHEN YOU SWITCH ON THE POWER IN THIS CONDITION?
    - The car runs in down direction.
      - **SW1 – 1 = ON**
        SW1 – 2 = OFF

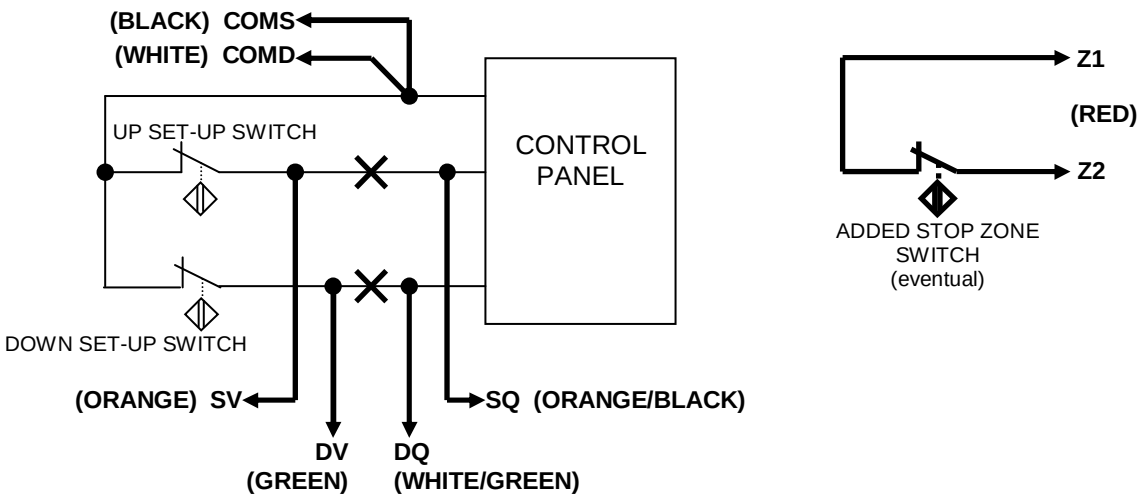
        Moreover, you must add a stop zone switch, activated when the car is at any floor level.

        SW1 – 4 = ON if N.A. type
        SW1 – 4 = OFF if N.C. type
    - The car runs in up direction.
      - **SW1 – 1 = ON**
        SW1 – 2 = ON

        Moreover, you must add a stop zone switch, activated when the car is at any floor level.

        SW1 – 4 = ON if N.A. type
        SW1 – 4 = OFF if N.C. type

CONNECTIONS



8 – FINAL CHECK AND TEST

Switch on the Main Power Switch, the Auxiliary Light switch, and the IE switch in RED-G.
Check that the lift is working properly, that on the front panel of RED-G the green led is ON and the red one is OFF, then check on the RGCON board the status of the following leds:

- 4P ON: 4th pole closed
- ST, RS ON: Mains Power is ON
- FA ON: RED-G OK
- A ON: RED-G ready to the rescue operation
- 5V ON: 5V Control circuit supply is ON

In case of installation in existing lifts, be sure that the Switches 1 – 2 – 4 are properly set, according to the instructions in paragraph 7.
You can now test the emergency operation following the instruction hereunder:

- Make a call for the lift, let it run for a while, then open the Main Power Switch and the Auxiliary Light switch when the car is between two floors.
- Make a jumper between the terminals S1-S2, because if the 4th pole is open, the lift cannot perform the emergency operation.

After a few seconds, the rescue operation starts, and you can follow the progress checking the led status on the RGCON board:

a) The Led A turns OFF.
b) The Led B and KE turn ON (rescue operation in progress)
c) The Led CC turns ON, it shows that the KE1 and KE2 contactor coils are supplied.
   Then the Led CT turns ON, to show that the contactors are properly energized, and they cut the external 3-phase mains.
d) The 3-phase inverter turns ON (leds UA, VA, WA flashing): the whole lift system is powered again.
e) Then the led BT turns ON, it shows that the motor brake is supplied.

The car runs at low speed and it stops at the next floor, opening the automatic doors.

f) After the de-energization of the motor brake (led BT turns OFF), RED-G waits for the time set with the P1 trimmer.
g) After this time, the 3-phase inverter turns OFF.
h) Then the KE1 and KE2 contactors are de-energized, putting the lift system in the original operation condition, powered by the Mains.
i) Both Leds A and B turn ON (rescue operation ended).
j) At the end of the rescue operation cycle, with no power still coming from the Mains, the KE relay holds ON to keep the external fan operating for a maximum time of 2 minutes.

When the Mains Power comes back, the leds RS and ST turn ON and the led B turns OFF. The KE relay, if still ON, is immediately de-energized.

8.1 – INSULATION TEST INSTRUCTIONS

1. Place the IE switch of RED-G in OFF position.
2. Disconnect the YELLOW/GREEN wire from EARTH.
3. In the same conditions you test the insulation of the different circuits of the control panel, test the insulation of the circuits of RED-G towards earth and towards the other circuits, on the terminals:
   - 400 on TT transformer
   - LL battery-charger supply 1~230Vac
   - Red/Black wires at the ends of series connected batteries (0V, 48V)

9 – TROUBLE SHOOTING

1) <u>The rescue operation doesn't start:</u>
   → Check that the 4th pole is closed.
   → Check that RED-G is powered (GREEN led on the front panel ON).
   → Check that RED-G doesn't show any fault, through the RED led on the front panel and the leds A and B on the RGCON board.
2) <u>The rescue operation starts, but the car doesn't run:</u>
   → Check that the car is not at any floor level.
   → Check that the control panel commands the set-up operation and that gives the inverter the low speed command.
   → Check that RED-G doesn't show any fault, through the RED led on the front panel and the leds A and B on the RGCON board.
   → Check if the phase sequence/missing device of the control panel is working properly.

If not, try to invert 2 output phases of RED-G device. If problem persists, use a N.O. contact of RED-G device to bypass the phase sequence/missing device contact.

3) The rescue operation ends properly, but door opens from undesidered side:
   → Lift installation has a double car entrance. Make a copy of the control panel wiring diagram and contact SMS.

10 – TECHNICAL SPECIFICATIONS

SIZE	BATTERIES	BATTERY CHARGER	OUTPUT 3~	OVERLOAD
1 (2000 VA)	N.4*12V 18Ah	N.1 54V 1.5 A (230Vac 50Hz +8/-15%)	400Vac +/- 10%, 50Hz, with neutral	3000 VA (1 min.)
2 (4000 VA)	N.8*12V 18Ah	N.2 54V 1.5 A (230Vac 50Hz +8/-15%)	400Vac +/- 10%, 50Hz, with neutral	6000 VA (1 min.)

Hardware Protections:
- Circuit-breaker 63A (IE)

Software Protections:
- Limit Current peak, medium current too high, overload
- 48V Check: Batteries discharged at 40V, overcharged at 60V
- Rescue Operation Maximum Time: 15 minutes, 1 minute at 50% overload

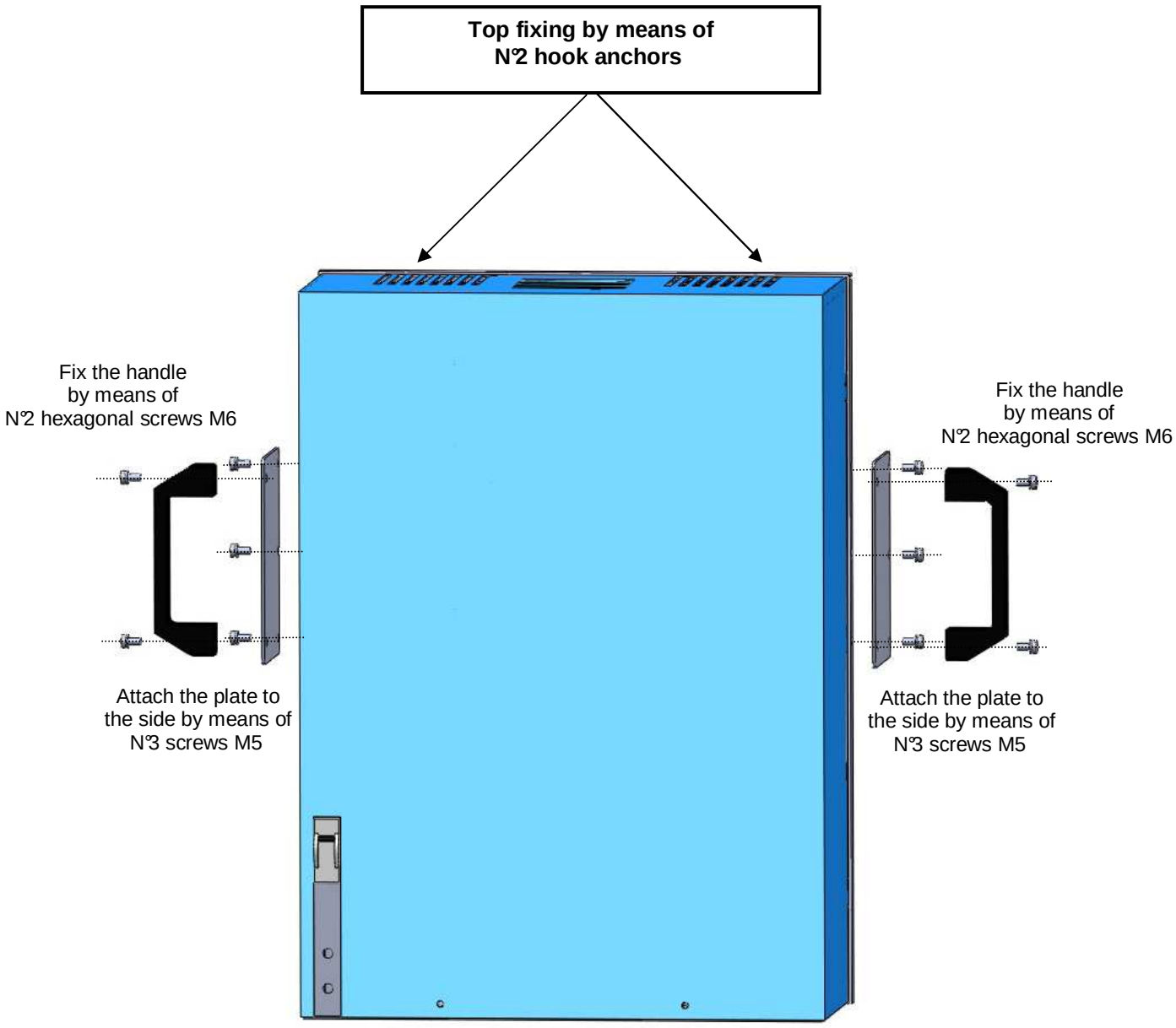
INPUTS
- Brake Voltage Check: Allowed Voltage 48 ÷ 230Vdc +/-10%
- Contacts 4P – ON : Rated Voltage 60Vdc max.
  Minimum Switching Current 5mA

OUTPUTS
- Contacts KE – FA – KS – KD: Switching Load 24Vdc/8A
  250Vac/8A
  110Vdc/0,3A
  Minimum Switching Load 5V/5mA

11 – DIMENSIONS AND WEIGHT

SIZE	Width (mm)	Width with side handles (mm)	Height (mm)	Depth (mm)	Weight (kg)
1	380	490	520	180	30
2	480	590	600	280	40

FRAME FIXING INSTRUCTIONS (SIZE 1)



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